Treatment of Intrahepatic Gallstones

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Introduction

Treatment of intrahepatic gallstones is still nowadays one of the most serious problems in biliary surgery. Since the disease per se is not malignant, liver resection should be avoided as far as possible, and some other conservative measures, by which gallstones can be extracted and the recurrence of stones can be prevented, should be employed.

During the last five years, the authors have succeeded in complete removal of intrahepatic stones from thirteen consecutive cases by transductal approaches via the common bile duct or hepatic duct. Only one case was treated by left lateral segmentectomy because of serious damage of liver perenchyma due to ductal stricture and dilatation.

In this paper three representative cases are presented briefly in order to demonstrate our techniques of transductal extirpation of intrahepatic stones and a new device developed by us.

Case reports

Case 1 : A 32 year old man was operated on for choledocholithiasis in a county hospital, and was found to have many bilirubin stones in the whole biliary tracts including bilateral intrahepatic bile ducts. In addtion to cholecystectomy and choledochotomy, a supraduodenal choledochoduodenostomy was performed expecting spontaneous delivery of the stones which could not be removed during the operation. No drainage tube was inserted into the biliary tracts. About two weeks after the operation, he began to suffer from cholangitis episodes of recurrent fever and jaundice which had not been observed before the operation

Key words : Intrahepatic gallstones, Choledochoscope, Hepaticojejunostomy with external jejunostomy.
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Then he was referred to our hospital and underwent percutaneous transhepatic cholangiography, which showed multiple stones in the dilated bile ducts including the bilateral hepatic ducts (Fig. 1). At the operation in our hospital, the extrahepatic bile ducts was incised from just above the stoma of choledochoduodenostomy up to the hepatic port and the intrahepatic stones were extracted by fingers and several instruments including a choledochoscope. Although most stones were removed by these procedures, some stones could not be removed, because they adhered stiffly to the wall of the bile ducts. The operation was ended leaving a silicon tube of 1 cm inner diameter in the common hepatic duct (Fig. 2). The preexisting stoma of choledochoduodenostomy was left as it was, because the stoma was sufficiently patent and was though to be of value in preventing bile stasis.

Fig. 1

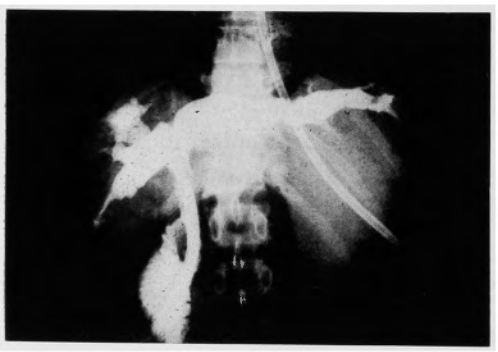

Fig. 2

After the operation, the residual stones were extracted through the silicon tube using both a choledochoscope and other instruments such as a basket catheter under control of X-ray television. About two months after the operation, the patient became completely free from residual stones and he has remained well for eight months until now.

Case 2 : A 52 year old woman was operated on for choledocholithiasis and a few stones were extracted from the common bile duct and from the left hepatic duct in our hospital. Her intraoperative cholangiogram and intraoperative cholangioscopic findings were interpreted as no residual stones being left in the bile ducts and the operation was finished leaving a T-tube of 7.5mm inner diameter in the common bile duct. Postoperative cholangiogram, however, showed residual stones in an anterior descending branch of the right hepatic duct (Fig. 3). A Kifa's gray catheter was inserted into the affected duct using a J-shaped guide wire (Fig. 4), then a balloon cathter was inserted through the Kifa's catheter and the stones were extracted (Fig. 5).

Case 3 : A 40 year old woman had sufferred from recurrent attacks of cholangitis for

Fig. 3

Fig. 4

Fig. 5

Fig. 6

eighteen years after cholecystectomy done for acalculous cholecystitis in a hospital.

In 1974, she was admitted to our hospital and her percutaneous transhepatic cholangiogram (Fig. 6) showed stricture of the extrahepatic bile duct and multiple stones in both

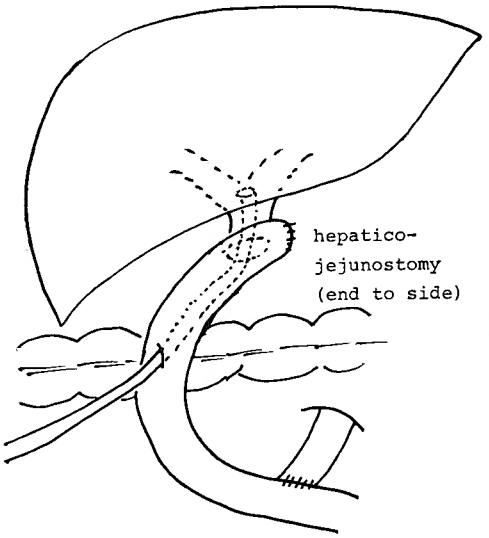

Fig. 7

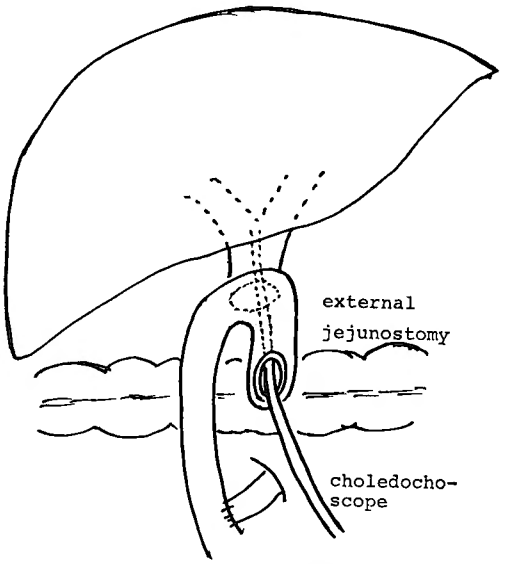

Fig. 9

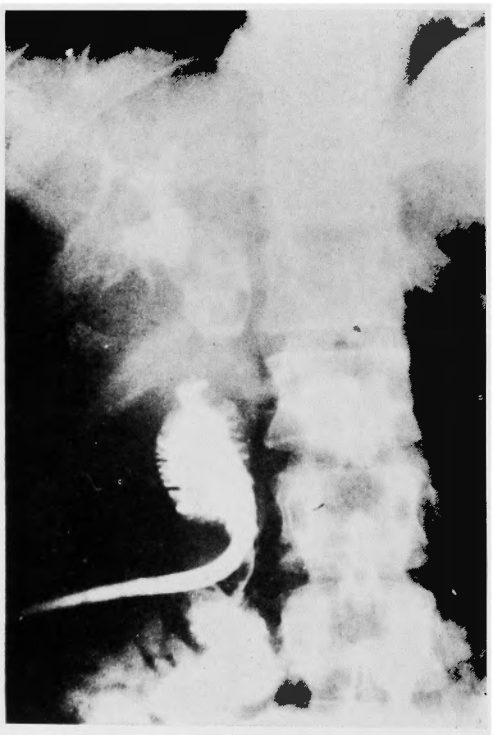

Fig. 8

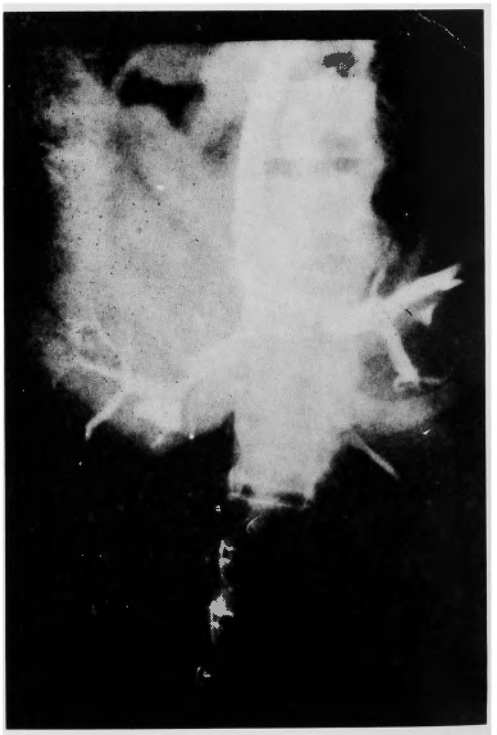

Fig. 10

extra- and intrahepatic bile ducts. At the operation, the common hepatic duct was cut transversely above the stricture and the stones were extracted as many as possible through the cut end, but many stones could not help to be retained in the intrahepatic ducts. A hepaticojejunostomy (end to side anastomosis in Roux-en Y type) was done and a straight tube was left in the hepatic duct as shown in Fig. 7, in order to facilitate the postoperative extraction of the residual stones. A few days later, however, the tube slid down from the stoma and could not be inserted into the hepatic duct again (Fig. 8).

At the second operation, hepaticojejunal anastomosis was reconstructed and the blind

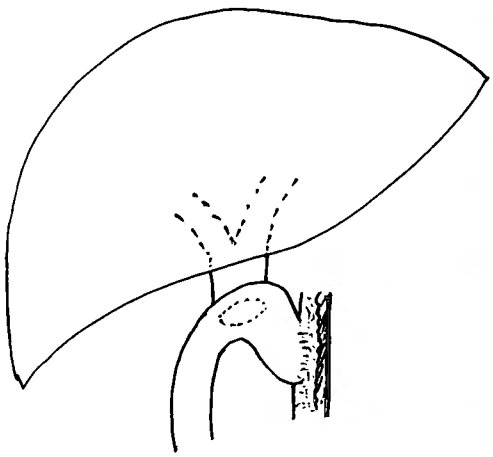

Fig. 11. External jejunostomy was closed in the subcutaneous tissue.

Fig. 12

Fig. 13

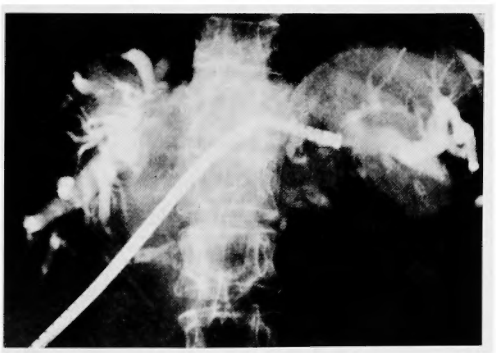

Fig. 14

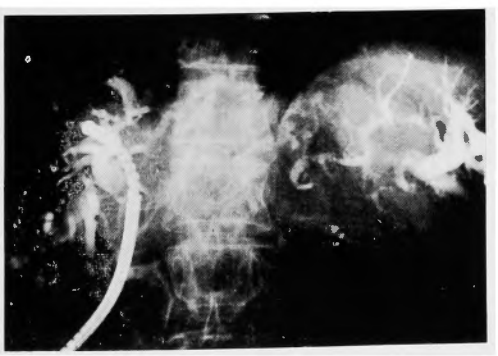

Fig. 15

loop of the jejunum was employed as an external jejunostomy, devising that the lumen of jejunum and that of hepatic duct run straightly (Fig. 9). After the operation, several instruments were inserted into the intrahepatic ducts through the external jejunostomy in order to extract the residual stones. Since at that time we had no choledochoscope, a urinary basket catheter (Dormia type) was mainly used (Fig. 10).

Stoma of the external jejunostomy was closed in the subcutaneous tissues after the complete removal of the intrahepatic stones (Fig. 11). The patient has been quite well for three and half years until now. Her liver scintigram with Au-colloid before surgery showed complete defect of the left lobe and central partial defect in the right lobe (Fig. 12), and that of 1.5 year after the surgery showed completely normal configuration of the liver (Fig. 13). Even if gallstones may be reformed in future, they shall be easily removed by opening again the external jejunostomy.

Discussion

Although liver resection is favored by some surgeons as a definitive surgery for intrahepatic stones, it should be reserved for the cases burdened with severe organic deterioration of the involved liver segments. Because, liver resection is naturally accompained by higher mortality than other conservative procedures. No surgeons can be sure that he does not overlook any stones in the preserved liver segments. Moreover, etiology of intrahepatic stones is not yet fully elucidated, though biliary stricture and stasis are mostly condemned as causative factors. From these standpoints of view, our basic strategy against intrahepatic stones is stone extraction through the extrahepatic bile ducts.

As a primary step of stone extraction during surgery, surgeon's fingers, stone scoops and forceps, biliary ballon catheters (Fogarty 5F or 6F) and so on are inserted to the intrahepatic ducts through the extrahepatic duct, which is often incised extensively up to the hepatic port. Explosive flashings of the ducts with saline through a tube are sometimes effective to wash out the intrahepatic stones.

However these blind maneuvers are not always successful and are in danger of bile duct injuries and of pushing back the stones deeply. Nowadays, three types of choledochoscope are available for direct visions of the lumen of intrahepatic ducts, for selective cholangiography and for stone extraction (Figs. 14 and 15). Ability of choledochoscopic maneuver, however, is self-limited because of weakness of its accessory instruments. Therefore we usually finish the choledochoscopic maneuver within one hour even in the presence of many retained stones, for which postoperative extraction is planned.

Usually, a T-tube with a large diameter is left in the common bile duct, either through which or through its sinus tract several instruments including a choledochoscope can be inserted into the intrahepatic ducts to remove stones. A straight silicon tube with a large diameter and with a side hole in its wall can be used more conveniently as shown in Case 1.

For the cases with intrahepatic stones which can not be approached by a choledo-

choscope because of bile duct anatomy, a technique like Seldinger's method using a J-shaped guide wire and a catheter under X-ray television can be used as shown in Case 2.

For the cases with large and recurrent intrahepatic stones, our hepaticojejunostomy with external jejunostomy is best indicated. This operation affords not only a pathway for spontaneous delivery of large stones but also the viaduct for instrumental extraction of stones. Moreover, recurrent stones can be easily removed by opening the external jejunostomy stoma again.

Summary

During the last five years, 13 cases of intrahepatic stones were successfully treated by transductal extraction of the stones but one by left lateral segmentectomy.

In place of liver resection, which should be reserved for the patients with severe deteriorations of the liver parenchyma, transductal approaches should be attempted both during and after surgery using several instruments including choledochoscopes. Three representative cases are presented in order to demonstrate our various techniques for transductal extraction of intrahepatic stones.

As one of the transductal approaches, hepaticojejunostomy with external jejunostomy, which was evolved by us, is best indicated for large and recurrent intrahepatic stones.

The gist of this paper was presented at the 11th Annual Meeting of the Japanese Society of Gastroenterological Surgery (Chiba, Feb. 28, 1978) by K. Maruyama and at the Symposium on Intrahepatic Gallstones held in the 3rd Annual Meeting for Biliary Tract Surgery (Fukuoka, Apr. 6, 1978) by M. Nagase.

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和文抄録

肝内結石症の治療

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瀬戸山元一，鎌田　寿夫，向原　純雄，丸山　啓介
加藤　仁司，日笠　頼則

過去5年間に取扱った肝内結石症14例中，左葉外側区域切除術を行なった1例を除く13例に対して，術中または術後に肝外胆管を介して胆道内視鏡やバスケットカテーテルなどの器具を用いて，結石を除去することに成功した．そのうちの3例の概要をのべて著者らの肝内結石除去法の要点をのべると共に，著者らが考案した肝管空腸端側吻合術（Roux-Y 型）兼空腸外瘻造設術の利点を強調した．